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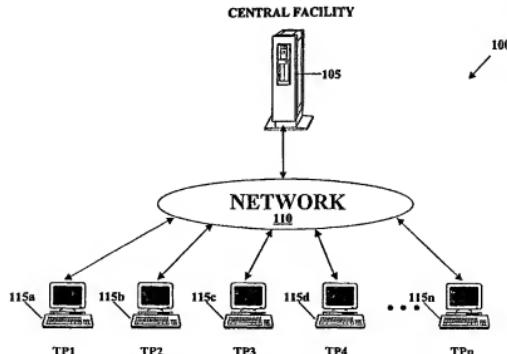
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(54) Title: SYSTEM AND METHOD FOR FACILITATING TRADES IN A TRADING SYSTEM



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(57) Abstract: Orders relating to financial instrument trading from a plurality of trading parties are processed in a trading system (100) having a plurality of trading stations (TP1-TPn) connected to a central facility or host (105). The trading system receives orders associated with a plurality of counter-parties and displays to at least one trading party orders of selected counter-parties that the trading parties willing to transact with according to trading preferences of the trading party. In this way, a trading party at a trading station may quickly view in real-time orders and/or trades of those counter-parties that it wishes to transact with or ignore orders and/or trades of those parties that it does not wish to transact with. The trading preferences may include the identities of those counter-parties that the trading party is willing or unwilling to transact with and may be entered prior to and during a trading session.



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**SYSTEM AND METHOD FOR FACILITATING
TRADES IN A TRADING SYSTEM**

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FIELD OF THE INVENTION

The present invention is generally related to a trading system for trading items such as financial instruments.

BACKGROUND OF THE INVENTION

10 Electronic trading systems facilitate transactions between trading parties by enabling the parties to execute trades automatically. Certain systems also allow the trading parties to deal directly with each other instead of through a broker, thus reducing costs. In a typical direct dealing system, the trading parties are interconnected through a communications medium (e.g., local area network, Internet, etc.), and each trading party has a display that shows
15 the current state of the market based on data input by the various parties using an input device such as a keyboard. The display might show current bids and offers for certain items, such as financial instruments, and other related data. A trading party can study the information on the display and take certain actions based on that information. The actions might include accepting a bid or offer or placing additional bids or offers. Although such systems provide many
20 advantages over traditional systems for trading such items, there are also disadvantages to these electronic systems. For example, in complex systems, the amount of data that is presented to a trading party can be overwhelming and it can be difficult to quickly and accurately filter and evaluate the unique characteristics specified by each market participant such that each participant can make appropriate decisions.

SUMMARY OF THE INVENTION

In general, the invention features a method and system to process orders for one or more trading parties in a trading system. In one embodiment, the trading system can receive orders associated with a plurality of counter-parties, and filter the orders to identify for display 5 orders of selected counter-parties that a trading party is willing to transact with according to trading preferences of the trading party. The filtered orders can then be displayed to the trading party.

In certain preferred embodiments, the system filters not only according to the preferences of the trading party but also according to the preferences of all relevant counter-10 parties. Thus, for example, only bids and offers can be displayed for a particular trading party that satisfy each of the following conditions: (1) it must be a bid or offer from a counter-party that the trading party is willing to do business with; and (2) it must be a bid or offer from a counter-party that is willing to do business with the trading party.

In this way, a trading party at a trading station may quickly view in real-time 15 orders and/or trades of those counter-parties that it wishes to and can transact with and ignore orders and/or trades of those parties that it does not wish to or can not transact with. The trading preferences may be entered prior to and during a trading session.

Certain preferred embodiments of the present invention may provide for a variety of filtered market views, which may include:

20 (1) A view of orders and/or trades of all counter-parties with the orders and/or trades of selected counter-parties that the trading party wishes to transact with distinguished from the other orders and/or trades. The selected counter-parties' orders and/or trades may be distinguished by highlighting them, by using different colors and/or intensity levels, by marking

them with a symbol such as a check mark, asterisk, a pointer, an arrow or any other identifier, by flashing the selected order and/or trades, or a combination thereof.

(2) A view of orders and/or trades of the counter-parties with the orders and/or trades of selected counter-parties in which both the trading party and the counter-parties are willing to transact with each other being distinguished from the other orders and/or trades. This view provides a trading party with a view of the feasible orders.

(3) A view of only those orders and/or trades of those counter-parties that the trading party is willing to transact with.

(4) A view of those orders and/or trades as described above in (1)-(3) in which the orders are distinguishably displayed according to a priority level, e.g., most preferred, preferred, acceptable, defined by the trading party. The orders and/or trades may be distinguished by different colors and/or intensity levels, by marking them with different symbols, such as a check mark, asterisk, a pointer, an arrow or any other identifier, or a combination thereof.

These filtered market views may also include or not include, as desired, the identities or source of the trading parties associated with the orders and/or trades; may have the bids and offers arranged from best to worst; may have the number of displayed bids and offers limited to a predetermined number; and so forth.

In one embodiment, at least one trading station in the trading system is configured to receive trading preferences from a trading party prior to and during an active trading session, to receive all orders and/or trades of counter-parties from the central facility, to filter orders and/or trades of counter-parties to identify for display only orders of selected counter-parties according to the previously entered trading preferences of the trading party and, accordingly, to display the filtered orders and/or trades of the selected counter-parties to the trading party.

In another embodiment, the central facility is configured to receive trading preferences from a plurality of trading parties prior to and during an active trading session, to receive orders from a plurality of trading parties, to filter orders of the trading parties to identify for display to at least one trading party orders of selected counter-parties according to trading preferences of at least the trading party and, accordingly, to transmit the filtered orders to the trading station utilized by the trading party for display.

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The display filtering approach may involve filtering the orders of the trading party to retain only the orders of the selected counter-parties according to the trading preferences and transmitting the filtered orders to the trading station associated with the trading party.

10 Alternatively, the filtering approach may involve identifying the orders of the selected counter-parties and transmitting the orders of all the counter parties including the identified orders to the trading station associated with the trading party.

15 While the filtering of the orders and, if desired, trades is preferably performed either at the trading stations or the central facility as discussed above, this process may also be performed at any location in the trading system.

The central facility is preferably configured to execute orders of trading parties according to the trading preferences of the trading parties. The central facility will execute a matching offer of one trading party with a bid of another trading party if both parties are willing to trade with each other based on their trading preferences. In other words, the central facility 20 will prevent transactions between trading parties in which at least one trading party is not willing to transact with the other trading party.

In a further embodiment, the present invention provides an electronic mail system and method, preferably integrated into the trading system, which enables a trading party to

generate electronic mail proposing modification of at least a term or condition of an order from a counter-party; automatically associates the electronic mail with the order; and sends the electronic mail to the counter-party.

Other and further aspects of the present invention will become apparent during the course of the following description and by reference to the attached drawings.

BRJEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a general overview of a distributed trading system having a central facility or host connected to a plurality of trading stations (TSs) utilized by a plurality of trading parties (TPs);

Fig. 2 is a schematic block diagram illustrating the components of trading system 115 of Fig. 1;

Fig. 3 illustrates an example of trading preferences database 235 of Fig. 2;

Fig. 4 is a flowchart illustrating an exemplary process by which orders are processed based on a trading party's preferences at a trading station in accordance with an embodiment of the present invention;

Fig. 5 is a schematic block diagram illustrating the components of central facility 105 of Fig. 1;

Fig. 6A illustrates one embodiment of trading preferences database 535 of Fig. 5 wherein the trading preferences for each of the trading parties are stored separately;

Fig. 6B illustrates another embodiment of trading preferences database 535 of Fig. 5 wherein, for each of the trading parties, a list of feasible counter-parties according to the trading preferences of all trading parties is stored;

Fig. 7 is a flowchart illustrating an exemplary process by which orders are processed at a central facility based on trading preferences;

Fig. 8A illustrates a screen display of bids and offers provided to a trading party;

Fig. 8B illustrates a screen display of a filtered market view of bids and offers

5 provided to trading party TP1 according to trading preferences of TP1 shown in Fig. 6A;

Fig. 8C illustrates another screen display of a filtered market view of bids and offers provided to trading party TP1 according to trading preferences of TP1 shown in Fig. 6A;

Fig. 8D illustrates a screen display of a filtered market view of feasible bids and offers provided to trading party TP1 according to trading preferences database 535 of Figs. 6A

10 and 6B; and

Fig. 9 is a flowchart illustrating an exemplary process by which electronic mail (email) involving an order is associated with the order.

Fig. 10 is an overview of a trading system that utilizes one or more local servers to service multiple trading stations.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Fig. 1, distributed trading system 100 includes a central facility or host 105 (hereinafter "central facility") connected to a plurality of trading stations (TS) 115a-115n utilized by respective trading parties (TP) TP1-TPn, across network 110. Although each 20 trading party is shown in Fig. 1 as using a corresponding trading station 115, a trading party may utilize or have associated therewith more than one trading station 115. Similarly, trading parties can use the same station.

Central facility 105 receives orders, such as bids and offers, for at least one financial instrument, e.g., bonds, currencies, stocks, commodities, etc., from trading stations 115, stores the unexecuted bid and offer orders, executes trades for matching offers and bids and transmits unexecuted orders and executed trades to trading stations 115 for display.

5 Trading stations 115 display the unexecuted orders received from central facility 105, receive orders from trading parties, and transmit the orders entered by the trading parties to central facility 105 for processing.

10 Distributed trading system 100 further provides an electronic mail system to enable trading parties to send electronic mail (email) to each other. Email is sent from one trading station to another trading station via central facility 105.

15 Distributed trading system 100 further receives information relating to trading preferences entered by at least one trading party via a trading station 115 prior to and/or during a trading session. The trading preferences include the identity of any counter-parties that the trading party is willing or not willing to transact with and, if desired, a priority level, e.g., most preferred, preferred, acceptable, associated therewith. The trading preferences may take the form of a set of counter-parties and associated preferences indicating whether the trading party is willing or not willing to transact with the respective counter-parties.

20 The trading preferences can also include specified maximum amounts that the trading party is willing to commit to a particular counter-party. For example, a trading party may not be willing to transact more than a certain dollar amount of business with a particular counter-party. As discussed further below, the system can then filter out any bids or offers from this counter-party that exceeded this amount, but would not filter bids and offers less than this amount.

These trading preferences are utilized by distributed trading system 100, for example by central facility 105 and/or the trading station 115 or another network or system component (not shown), to process the outstanding orders from all counter-parties to enable trading station 115 to display orders and/or trades of selected counter-parties according to the

5 trading preferences or criteria of the trading party utilizing the trading station. In this way, a trading party at trading station 115 may quickly view orders and/or trades of those counter-parties that it wishes to transact with or ignore those orders and/or trades of those parties that it does not wish to transact with.

Trading station 115 is preferably configured to provide a trading party a variety of

10 filtered market views in accordance with the trading preferences of the trading party. These market views may include, in addition to any conventional market views, the following:

(1) A view of orders and/or trades of all counter-parties with the orders and/or trades of selected counter-parties that the trading party wishes to transact with distinguished from the other orders and/or trades. The selected orders and/or trades may be distinguished by

15 highlighting them, by using different colors and/or intensity levels, by marking them with a symbol such as a check mark, a pointer, an arrow or any other identifier, by flashing the selected order and/or trades, or a combination thereof.

(2) A view of orders and/or trades of the counter-parties with the orders and/or trades of selected counter-parties in which both the trading party and the counter-parties are

20 willing to transact with each other being distinguished from the other orders and/or trades. This market view provides a trading party with a display of the feasible orders.

(3) A view of only those orders and/or trades of those counter-parties that the trading party is willing to transact with.

(4) A view of those orders and/or trades as described above in (1)-(3) in which the orders are distinguishably displayed according to a priority level, e.g., most preferred, preferred, acceptable, defined by the trading party. The orders and/or trades may be distinguished by different colors and/or intensity levels, by marking them with different symbols such as a check mark, a pointer, an arrow or any other identifier, or a combination thereof.

While the above describes various examples of how orders and/or trades may be displayed according to trading preferences of a trading party, distributed trading system 100 may display the orders and/or trades in other modified forms. For example, the market views may also include or not include, as desired, the identity of the trading parties associated with the 10 orders and/or trades. This provides distributed trading system 100 with the flexibility to preserve anonymity. Typically, the bids and offers are displayed from best to worst and the number of bids and offers displayed may be limited to a desired number, e.g., displaying the 10 best bids and offers.

In one embodiment of the invention, trading stations 115 are configured to 15 perform the display filtering feature of the present invention. For example, trading station 115 receives trading preferences from a trading party prior to and during an active trading session, receives all orders and/or trades of counter-parties, filters the orders and/or trades of the counter-parties to identify for display orders and/or trades only of selected counter-parties that the trading party is willing to transact with according to the previously entered trading preferences of the 20 trading party and, accordingly, displays the filtered orders and/or trades of the selected counter-parties to the trading party. If the trading preferences of the counter-parties are not provided to trading station 115, then an order may be displayed to a trading party although the counter-party does not wish to trade with the trading party. However, if the preferences of the counter-parties

are provided to trading stations 115, then each trading station can provide filtered views to its associated trading party that takes the counter-parties' preferences into account.

In another embodiment, central facility 105 is configured to perform the filtering feature according to preferences entered by the community of trading parties. For example,

- 5 central facility 105 receives trading preferences from a plurality of trading parties prior to and during an active trading session, receives and has received orders from the plurality of trading parties, filters orders and/or trades of the trading parties to identify for display to at least one trading party orders of selected counter-parties that the trading party is willing to transact with according to trading preferences of the trading party and, accordingly, transmits the filtered
- 10 orders to the trading station utilized by the trading party for display. Orders are preferably displayed to a trading party only if the counter-parties are willing to trade with the trading party.

For example, central facility 105 may transmit only those orders and/or trades of counter-parties that a trading party is willing to transact with or may transmit only those orders and/or trades of counter-parties in which both the trading party and counter-party are willing to transact with each other. Such an arrangement is a great convenience and is a time-saver for the trading parties, and also reduces the amount of data transmission and processing throughout 15 distributed trading system 100.

Alternatively, central facility 105 may transmit to at least one trading station 115 orders and/or trades of counter-parties, with selected orders and/or trades being indicated or 20 identified according to the trading preferences of the trading party. For example, central facility 105 may indicate orders and/or trades of counter-parties that the trading party is willing to transact with or may indicate orders and/or trades of counter-parties in which both the trading party and the counter-party are willing to transact with each other.

The filtering feature may also be performed by a local server that is associated with a number of trading stations 115. For example, a server on a local area network or wide area network can perform the filtering for many trading stations. The local server communicates with the central facility and each of its trading stations to receive the trading preferences, orders and/or trades of all parties in the trading system.

5 An overview of such a system is shown in Fig. 10 and includes trading stations 115, network 110 and control facility 105 which are similar to those components shown in Fig. 10. However, trading stations 115 are connected to network 110 through local server 107. The overall system can include a number of similar local servers 107, each of which serves a plurality 10 of trading stations. Filtered views are provided to each trading station in a manner similar to that discussed above.

In a further embodiment, an electronic mail system is provided which enables electronic mail (email) to be transmitted between trading stations 115 via central facility 105. For a selected bid or offer, a trading party transmits email to a counter-party associated with the 15 selected bid or offer. Through the use of email, a trading party proposes to counter-parties real-time modifications or changes to terms and conditions of their bid or offer. These modifications may include changes to the price and/or quantity of the instrument, a credit limit, and/or any other terms and conditions associated with the selected bid or offer. The email is automatically associated with the selected bid or offer to provide an electronic trail of the negotiations between 20 the trading parties, with a copy of the email stored at a location accessible to the negotiating parties. This electronic trail is particularly useful during trade clearance.

Fig. 2 is a schematic block diagram illustrating the components of a trading station 115 of Fig. 1. Conventional computer components are included, such as a processor 200,

user input devices 205, e.g., keyboard, mouse, etc., for receiving inputs from a trading party, network interface 210 for interconnection to central facility 105, RAM 215, ROM 220, display 225 and storage device 230. Storage device 230 stores trading preferences database 235

maintaining information associated with trading preferences or criteria of a trading party. For

5 example, database 235 can include information on which counter-parties a trading party is willing and unwilling to transact with, a priority level for the counter-parties (e.g., most preferred, preferred, acceptable, etc.), and amount limits (e.g., by dollar or volume). Storage device 230 may also store any emails associated with orders sent to and received from other trading parties, for example, those messages containing negotiation history relating to an order.

10 These emails may later be forwarded to a clearance system to facilitate clearing and settlement of executed trades where the terms and conditions of the bid or offer were modified between the trading parties.

In accordance with one embodiment, processor 200 is preferably configured to receive, store and update trading preferences from a trading party prior to and during an active

15 trading session; to receive orders and/or trades of a plurality of counter-parties from central facility 105; to filter the orders of counter-parties to identify for display orders and/or trades of selected counter-parties that the trading party is willing to transact with according to trading preferences of the trading party; and to cause display 225 to display the filtered orders and/or trades. The filtered orders and/or trades may be displayed in a variety of ways, as discussed

20 above.

In a system such as that shown in Fig. 10, much of the processing done by processor 200 can be performed by the local server and processor 200 can function primarily to facilitate communication between its various trading stations and the local server.

Fig. 3 illustrates an example of trading preferences database 235, accessible by trading station 115, which maintains information associated with a trading party utilizing trading station 115. Trading preferences database 235 includes a trader identifier field 300 identifying each registered trading party, e.g., TP1-TPn, and trade field 310 indicating whether the trading 5 party wishes to transact business with these counter-parties. For example, the trading party will transact business with the trading party TP2, but not with trading party TP1. The trading preferences database 235 may also contain priority level field 320 identifying a level of willingness to trade with a registered trading party, such as a most preferred level, a preferred level and an acceptable level. Priority level field 320 may be utilized to further distinguish the 10 displayed orders and/or trades. An amount field 330 is also provided to place any desired limit on the business conducted with an acceptable counter-party, such as by volume (e.g., number of shares) or by dollar amount.

While trading database 235 is shown as storing trading preferences information for one trading party, in another embodiment, trading database 235 stores information for a 15 plurality of trading parties who share trading station 115. Trading database 235 is maintained locally at respective ones of trading stations 115, but may instead be maintained at any location accessible to trading stations 115.

Fig. 4 is a flowchart illustrating how orders are processed at a trading station 115 in the system of Fig. 1 based on a trading party's preferences. At step 410, prior to and/or during 20 an active trading session, a trading party enters trading preferences via trading station 115 in distributed trading system 100, and, at step 420, trading station 115 stores and/or updates the trading preference information maintained in trading preferences database 235.

At step 430, prior to and/or during an active trading session, a trading party may also enter orders at trading station 115. The orders may be a bid or offer including a price and quantity of a financial instrument, as well as any limitations to the terms and conditions of the order, such as whether only a block trade is acceptable or whether partial executions are

5 acceptable. At step 440, trading station 115 transmits any orders entered by the trading party to central facility 105, via network 110. The dashed lines in Fig. 4 illustrate the data flow to and from central facility 105.

At step 450, trading station 115 receives orders and trades of counter-parties from central facility 105. As discussed below, the trading preferences of the counter-parties may also

10 be received. At step 460, trading station 115 then filters the orders according to current trading preferences of the trading party at trading station 115. At step 470 the trading system arranges the bids and offers from best to worst and then executes the trades for any matching bids and offers (step 480). Any filtered unexecuted bids and offers are displayed at step 490 along with any executed trades, if desired. Finally, at step 495, the executed trades are communicated back

15 to the central facility, which can inform the appropriate counter-parties.

Trading station 115 may also filter out from the orders any information identifying a source of the orders to prevent display and preserve anonymity of the source of the orders. Alternatively, trading station 115 may suppress or prevent display of the source of the orders to the trading party.

20 As noted above, step 460 may use the received preferences of the counter-parties to also filter out bids and offers for any counter-parties that are not willing to do business with the trading party at the trading station 115 at issue. This further reduces the amount of data presented to the trading party and displays only data on which the party can successfully act.

Fig. 5 is a block diagram illustrating the components of central facility 105 of Fig.

1. Conventional computer components are included, such as processor 500, network interface 505 for communicating with the plurality of trading stations 115, RAM 510, ROM 515 and storage device 525 for storing information. Storage device 525 stores a database or list 530 of 5 the registered traders in distributed trading system 100 to identify which trading parties are on which trading stations, a database or list 535 of the trading preferences or criteria of the registered trading parties, for example, which counter-parties a trading party is willing or unwilling to transact with and with parties each counter-party is willing or unwilling to transact with. The storage device 525 also stores outstanding offers, bids and recently executed trades 10 database or list 540 for of the plurality of trading parties in distributed trading system 100.

In accordance with another embodiment, processor 500 is preferably configured to receive, store and update trading preferences from at least one trading party; to receive orders from the plurality of trading parties; to sequence the orders from best to worst; to execute any matching bid and offers; to filter the remaining unexecuted orders and/or trades of the trading 15 parties to identify for display to the at least one trading party orders and/or trades of selected counter-parties according to current trading preferences of the trading party and; accordingly, to transmit the filtered orders and/or trades to the trading station utilized by the trading party for display.

The filtering of the orders and/or trades may take various forms depending on the 20 market view to be displayed at trading station 115. For example, processor 500 may simply filter out all orders except those from the selected counter-parties that the trading party is willing to transact with and provide only the filtered orders and/or trades to the trading station of the trading party for display. Alternatively, processor 500 may identify or indicate those orders from

counter-parties that the trading party is willing to transact with and provide all orders and/or trades including the identified orders and/or trades to trading station 115 of the trading party for display.

While the above describes a display filtering operation for one trading party,
5 processor 500 may alternatively be configured to perform the filtering and transmission operation for each of the trading parties according to their trading preferences.

In addition to the display filtering feature, processor 500 is configured to execute orders of trading parties according to the trading preferences of the trading parties. Processor 500 executes an offer from one trading party that matches a bid from another trading party only
10 if both parties are willing to transact business with each other, thereby preventing transactions between trading parties in which at least one trading party is not willing to transact with the other trading party.

Fig. 6A illustrates trading preferences database 535A, accessible by the central facility 105, which maintains information associated with the trading parties of distributed
15 trading system 100. Trading preferences database 535A includes a trader identifier field 605 identifying each registered trading party (e.g., TP1, TP2 . . . TPn) and acceptable counter-parties field 610 identifying counter-parties that each trading party will transact with. For example, trading party TP1 will transact business with trading parties TP1, i.e., itself, TP2, TP3, TP9 and TPn. A trading party is, of course, usually willing to do business with itself, which may be the
20 case where the trading party is acting as an agent for multiple customers, who may buy and sell to each other. In such situations, however, it may be preferable for the trading party to use different TP numbers for each customer to make it clear that different parties are involved.

Fig. 6B illustrates trading preferences database 535B, accessible by the central facility 105, which maintains information associated with the trading parties of distributed trading system 100. Trading preferences database 535B includes a trader identifier field 615 identifying each registered trading party (e.g., TP1, TP2 . . . TPn) and feasible counter-parties field 610 identifying for each trading party only those counter-parties where both the trading party and the counter-party will transact with each other, according to their trading preferences. That is, trading preference database 535 stores a list of mutually agreeably counter-parties which can be determined by central facility 105 from the trading preferences provided by the trading parties in distributed trading system 100. For example, trading party TP1 can trade with counter-parties TP1, TP3, TP9 and TPn, but not with trading party TP2 who is unwilling to trade with trading party TP1.

Fig. 7 is a flowchart illustrating the filtering process by which orders are processed at central facility 105 based on trading preferences of at least one trading party. At step 710, prior to and/or during an active trading session, central facility 105 receives trading preferences information from registered trading parties via trading stations 115 in distributed trading system 100 and, at step 720, stores and updates the trading preferences information in the trading preferences database 535.

At step 730, prior to and/or during an active trading session, central facility 105 also receives orders from the plurality of trading stations 115. The orders may be bids or offers including a price and quantity of the financial instrument, as well as any limitations to the terms and conditions of the order, such as time limit, a credit limit and so forth. At step 740, central facility 105 then centralizes all the unexecuted orders of trading stations 115.

At step 750, central facility 105 filters the orders to identify for each of the trading parties a set of orders of selected counter-parties according to the trading preferences stored in trading preferences database 535. That is, for each trading party, central facility 105 identifies those orders of counter-parties that the trading party will transact with and that are willing to

5 transact with the trading party. Filtering is also performed based on the other factors discussed above (amount, etc.). Central facility 105 may also filter out from the orders any information identifying a source of the orders to prevent or suppress display of the source of the orders. At step 760, central facility 105 arranges the filtered bids and offers from best to worst, respectively.

At step 770, central facility 105 then executes trades for any matching bids and offers. At step 10 780, central facility 105 transmits at least the identified orders and/or trades to each trading party.

Thus, central facility 105 filters orders and/or trades to identify for display to a trading party orders and/or trades in which both the trading party and the counter-party are willing to transact with each other, and transmits the filtered order and/or trades to that trading 15 party. In this way, the trading parties are only provided with real-time feasible bids and offers.

Fig. 8A illustrates a market view of bids and offers displayed to a trading party as in the prior art. There is shown bids and offers of all trading parties, with each bid and offer showing a quantity (QTY), a price and a source of the bid or offer. The bids and offers are ranked and displayed according to price and then some criteria, such as size of trade, first come 20 first serve, etc., for orders at the same price.

Fig. 8B illustrates one filtered market view of bids and offers displayed to trading party TP1 according to trading preferences of TP1 shown in Fig. 6A. As shown, bids and offers of all trading parties are displayed, with each bid and offer showing a quantity (QTY), a price

and a source of the bid or offer. However, bids and offers of selected counter-parties that the trading party will transact with are highlighted to distinguish them from the other bids and offers, and the bids and offers are arranged from best to worst. For example, only the bids and offers of parties TP1, i.e., itself, TP2, TP3, TP9 and TPn are highlighted.

5 As noted above, filtering can also be done based on preferences as to quantity and/or price for each trading party. For example, if TP1 had placed a maximum quantity of 1,000 units for TP9, then the second entry in Fig. 8B would not be highlighted since the quantity is 2,000.

10 While the bids and offers may be distinguished by highlighting them as shown in Fig. 8B, the selected bids and offers may be distinguished using different colors and/or intensity levels, by marking them with a symbol such as a check mark, a pointer, an arrow or any other identifier, by flashing the selected order and/or trades, or any combination thereof.

Fig. 8C illustrates another filtered market view of bids and offers displayed to trading party TP1 according to trading preferences of TP1 shown in Fig. 6A. As shown, bids and offers of only those counter-parties that trading party TP1 is willing to transact with are displayed. The quantity (QTY) and price of these bids and offers are displayed and, in this view, the source is not displayed. (Of course, a similar view can be created where the source is displayed). The bids and offers are also arranged from best to worst. For example, trading party TP1 will transact with parties TP1, i.e., itself, TP2, TP3, TP9 and TPn based on its trading preferences. Accordingly, only bids and offers of parties TP1, TP2, TP3, TP9 and TPn are displayed to trading party TP1.

20 Fig. 8D illustrates a filtered market view of feasible bids and offers displayed to trading party TP1 according to trading preferences of all trading parties, for example, as in Figs.

6A and 6B. As shown, only feasible bids and offers for trading party TP1 are displayed. That is, only selected bids and offers in which the trading party TP1 and counter-parties will transact with each other are displayed. As in Fig. 8C, the quantity (QTY) and price of these bids and offers are displayed, but not their source. (Optionally, the source could be displayed.) The bids and offers are also arranged from best to worst.

For example, trading party TP1 has mutually agreed with parties TP1, i.e., itself, TP3, TP9 and TPn to transact with each other based on their trading preferences. Accordingly, only bids and offers of parties TP1, TP3, TP9 and TPn are displayed to trading party TP1.

Although trading party TP1 will transact with party TP2, the bids and offers of party TP2 are not displayed because TP2 does not wish to transact with trading party TP1.

Fig. 9 is a flowchart illustrating an email tracking process by which electronic mail (email) regarding a selected order is associated with the selected order. At step 910, a trading party at trading station 115 selects a bid or offer displayed on the trading station and, at step 920, initiates an email message to a counter-party associated with the selected bid or offer.

15 At step 930, trading station 115 provides a graphical interface to enable the trading party to enter a message at block 930. Trading station 115 preferably automatically completes the header field of the email, such as "To", "From", and "Re" fields, to identify the trading party as the sender, the counter-party as the receiving party and the bid or offer as the subject matter of the email, thereby associating the email with the selected bid or offer by identification of the selected bid or offer. More specifically, a transaction identifier associated with the bid or offer is made 20 available for subsequent processing, such as trade clearance, in the subject matter field of the email. Alternatively, trading station 115 may automatically attach or insert a code or identifier

associating the email with the selected bid or offer. This code or identifier may simply be the transaction number of the selected bid or offer.

At step 940, the trading party may enter or compose a message associated with the selected bid or offer. This message may include proposed changes or modifications of at least one term or condition of the selected bid or offer. For example, the trading party may wish to alter the quantity or price of the selected bid or offer or any other terms and conditions of the selected bid or offer. After the trading party finishes entering the message (step 950), trading station 115 stores a copy of the email locally for example in email database 240 (step 960) and, at step 970, forwards the email to the counter-party of the selected bid or offer, via central facility 105.

At step 980, the email is received by the counter-party at another trading station 115 and is also stored locally in a corresponding email database 240. At step 990, the parties exchange any further email(s) including, ultimately, an acceptance or rejection of the proposed trade. For example, the counter-party may reply with additional changes to the terms and conditions of the bid or offer, with an acceptance of the proposed term changes or with a rejection of the proposed term changes. As with the previous emails, further emails are likewise associated with the bid or offer at issue, for example, with the header of the email preferably automatically filled with the identity of the sending party, the identity of the receiving party and the subject matter of the email, namely the transaction identifier of the offer or bid.

Through the provision of an electronic mail system provided by distributed trading system 100, trading parties may interact with each other to customize in real-time terms and conditions of bids and offers via email that is automatically associated with the bid or offer at issue. Copies of the emails are preferably stored locally at the trading stations of the

negotiating parties or at any location accessible by the parties, for example, at central facility 105. These emails may later be forwarded to a clearance system to facilitate clearing and settlement of executed trades where the terms and conditions of the bid or offer were modified between the trading parties. Such an arrangement provides an efficient process by which parties 5 may negotiate modifications of terms and conditions of a bid or offer while providing an electronic trail of the negotiations.

The many features and advantages of the present invention are apparent from the detailed specification, and thus, it is intended by the appended claims to cover all such features and advantages of the invention which fall within the true scope of the present invention.

10 Furthermore, since numerous modifications and variations will readily occur to those skilled in the art, it is not desired that the present invention be limited to the exact construction and operation illustrated and described herein, and accordingly, all suitable modifications and equivalents which may be resorted to are intended to fall within the scope of the claims.

CLAIMS

1. A method of processing orders for a trading party in an electronic trading system, comprising:

receiving orders associated with a plurality of counter-parties; and

filtering the orders to identify for display orders of selected counter-parties that the trading party is willing to transact with according to trading preferences of the trading party.

2. The method according to claim 1, wherein the orders are filtered according to trading preferences of the trading party and the counter-parties.

3. The method according to claim 1, further comprising receiving the trading preferences from the trading party.

4. The method according to claim 3, wherein the trading preferences include identities of counter-parties with which the trading party is willing or unwilling to transact trades.

5. The method according to claim 1, wherein the step of filtering retains only orders of the selected counter-parties for display.

6. The method according to claim 1, wherein the orders are filtered at a trading station of the trading party.

7. The method according to claim 6, wherein the trading preferences are stored at the trading station.

8. The method according to claim 1, wherein the orders are filtered at a central facility of the trading system.

9. The method according to claim 8, wherein the orders are filtered according to trading preferences of the trading party and the counter-parties.

10. The method according to claim 8, wherein the trading preferences are stored at the central facility.

11. The method according to claim 1, further comprising suppressing information identifying a source of the orders to prevent the display of the source information.

12. The method according to claim 1, further comprising displaying the orders of the selected counter-parties according to the trading preferences of the trading party.

13. The method according to claim 12, wherein the step of displaying displays only orders of the selected counter-parties.

14. The method according to claim 12, wherein the step of displaying displays orders of the plurality of counter-parties, the displayed orders of the selected counter-parties being distinguished from displayed orders of other than the selected counter-parties.

15. The method according to claim 12, wherein the step of displaying displays orders of counter-parties in which the trading party and the counter-parties are willing to transact with each other.

16. The method according to claim 12, wherein the trading preferences include an identity of the selected counter-parties and a priority level associated therewith, and wherein the step of displaying selectively displays orders of the selected counter-parties according to their priority level.

17. The method according to claim 12, wherein the step of displaying suppresses display of a source of the displayed orders.

18. The method according to claim 1, wherein the orders are associated with a trading of at least one financial instrument selected from the group consisting of bonds, stocks, currencies and commodities.

19. The method according to claim 1, further comprising:

enabling the trading party to generate electronic mail proposing modification of at least a term or condition of an order from a counter-party;

automatically associating the electronic mail with the order; and

sending the electronic mail to the counter-party.

20. The method according to claim 19, wherein the step of automatically associating completes a subject matter field of the electronic mail with a transaction identifier corresponding to the order.

21. The method according to claim 19, wherein the step of automatically associating encodes the electronic mail with a transaction identifier corresponding to the order.

22. The method according to claim 19, further comprising storing the electronic mail at a trading station used by the trading party.

23. The method according to claim 19, further comprising storing the electronic mail at a central facility in the trading system.

24. The method according to claim 19, further comprising automatically completing header fields of the electronic email to identify the trading party as a sending party and the counter-party as a receiving party.

25. The method according to claim 1, further comprising executing a matching bid and offer of the orders only if trading parties corresponding to the matched bid and offer have agreed to transact with each other based on their trading preferences.

26. The method according to claim 1, wherein the trading system comprises a plurality of processors located at remote locations.

27. An apparatus for processing orders for a trading party in a trading system, comprising:

means for receiving orders associated with a plurality of counter-parties; and
means for filtering the orders to identify for display orders of selected counter-parties that the trading party is willing to transact with according to trading preferences of the trading party.

28. The apparatus according to claim 27, wherein said means for filtering the orders filters the orders in accordance with trading preferences of the trading party and the counter-parties.

29. The apparatus according to claim 27, further comprising means for receiving the trading preferences from the trading party.

30. The apparatus according to claim 29, wherein the trading preferences include identities of counter-parties with which the trading party is willing or unwilling to transact trades.

31. The apparatus according to claim 27, wherein the means for filtering retains only orders of the selected counter-parties for display.

32. The apparatus according to claim 27, wherein the means for filtering filters orders at a trading station of the trading party.

33. The apparatus according to claim 32, further comprising means, associated with the trading station, for storing the trading preferences.

34. The apparatus according to claim 27, wherein the means for filtering filters orders at a central facility of the trading system.

35. The apparatus according to claim 34, wherein the orders are filtered according to trading preferences of the trading party and the counter-parties.

36. The apparatus according to claim 34, further comprising means, associated with the central facility, for storing the trading preferences.

37. The apparatus according to claim 27, further comprising means for suppressing information identifying a source of the orders to prevent display of the source of information.

38. The apparatus according to claim 27, further comprising means for displaying the orders of the selected counter-parties according to the trading preferences of the trading party.

39. The apparatus according to claim 38, wherein the means for displaying displays only orders of the selected counter-parties.

40. The apparatus according to claim 38, wherein the means for displaying displays orders of the plurality of counter-parties, the displayed orders of the selected counter-parties being distinguished from displayed orders of other than the selected counter-parties.

41. The apparatus according to claim 38, wherein the means for displaying displays orders of counter-parties in which the trading party and the counter-parties are willing to transact with each other.

42. The apparatus according to claim 38, wherein the trading preferences includes an identity of the selected counter-parties and a priority level associated therewith, the means for displaying selectively displaying orders of the selected counter-parties according to their priority level.

43. The apparatus according to claim 38, wherein information associated with a source of the displayed orders are suppressed to prevent display thereof.

44. The apparatus according to claim 27, wherein the orders are associated with a trading of at least one financial instrument selected from the group consisting of bonds, stocks, currencies and commodities.

45. The apparatus according to claim 27, further comprising:
means for enabling the trading party to generate electronic mail proposing modification of at least a term or condition of an order from a counter-party;
means for automatically associating the electronic mail with the order; and
means for sending the electronic mail to the counter-party.

46. The apparatus according to claim 45, wherein the means for automatically associating completes a subject matter field of the electronic mail with a transaction identifier corresponding to the order.

47. The apparatus according to claim 45, wherein the means for automatically associating encodes the electronic mail with a transaction identifier corresponding to the order.

48. The apparatus according to claim 45, further comprising means for storing the electronic mail at a trading station used by the trading party.

49. The apparatus according to claim 45, further comprising means for storing the electronic mail at a central facility in the trading system.

50. The apparatus according to claim 45, further comprising means for automatically completing header fields of the electronic email to identify the trading party as a sending party and the counter-party as a receiving party.

51. The apparatus according to claim 27, further comprising means for executing a matching bid and offer of the orders only if trading parties corresponding to the matched bid and offer have agreed to transact with each other based on their trading preferences.

52. The apparatus according to claim 27, wherein the trading system comprises a plurality of processors located at remote locations.

53. A trading station for processing orders for a trading party in a trading system, comprising:

a display for displaying orders; and

processor for receiving orders of a plurality of counter-parties and filtering the orders to identify for display orders of selected counter-parties that the trading party is willing to transact with according to trading preferences of the trading party.

54. The trading system according to claim 53, wherein said processor filters said orders according to trading preferences of the trading party and the counter-parties.

55. The trading station according to claim 53, further comprising a memory for storing the trading preferences of the trading party.

56. The trading station according to claim 53, wherein the trading preferences includes an identity of counter-parties with which the trading party is willing or unwilling to transact trades.

57. The trading station according to claim 53, wherein the processor filters the orders to retain only orders of the selected counter-parties for display.

58. The trading station according to claim 53, wherein the processor further suppresses information associated with a source of the orders to prevent display of the source information.

59. The trading station according to claim 53, wherein the processor further causes the display to display orders of selected counter-parties according to trading preferences of the trading party.

60. The trading station according to claim 59, wherein the display displays only the orders of the selected counter-parties.

61. The trading station according to claim 59, wherein the display displays orders of the plurality of counter-parties, the displayed orders of the selected trading parties being distinguished from displayed orders other than the selected counter-parties.

62. The trading station according to claim 59, wherein the display displays orders of counter parties in which the trading party and the counter-parties are willing to transact with each other.

63. The trading station according to claim 53, wherein the trading preferences includes an identity of the selected counter-parties and priority levels associated therewith, the display selectively displaying orders of the selected counter-parties according to their priority level.

64. The trading station according to claim 53, wherein a source of the displayed orders are prevented from being displayed.

65. The trading station according to claim 53, wherein the processor further enables the trading party to generate electronic mail proposing modification of at least a term or condition of an order from a counter-party and automatically associates the electronic mail with the order.

66. The trading station according to claim 65, wherein the processor causes the electronic mail to be forwarded to the counter-party.

67. The trading station according to claim 65, wherein the processor automatically completes a subject matter field of the electronic mail with a transaction identifier corresponding to the order.

68. The trading station according to claim 65, wherein the processor encodes the electronic mail with a transaction identifier corresponding to the order.

69. The trading station according to claim 65, wherein a copy of the electronic mail is stored in the memory.

70. The trading station according to claim 65, wherein the processor automatically completes header fields of the electronic email to identify the trading party as a sending party and the counter-party as a receiving party.

71. A central facility for processing orders for a trading party in a trading system, comprising:

a processor for receiving orders of a plurality of trading parties, the processor filtering the orders to identify for display to the trading party orders of selected counter-parties that the trading party is willing to transact with according to trading preferences of the trading party; and

transmitter for transmitting the filtered orders to a trading station of the trading party for display.

72. The central facility according to claim 71, wherein said processor filters the orders according to trading preferences of the trading party and the counter-parties.

73. The central facility according to claim 71, further comprising memory for storing the trading preferences of the trading party.

74. The central facility according to claim 71, wherein the trading preferences includes an identity of trading parties with which the trading party is willing or unwilling to transact trades.

75. The central facility according to claim 71, wherein the processor filters the orders to retain only orders of the selected trading parties for display to the trading party.

76. The central facility according to claim 71, wherein the processor filters the orders to suppress display of a source of the orders to the trading party.

77. The central facility according to claim 71, wherein the processor filters the orders to enable the trading station of the trading party to display only the orders of the selected trading parties.

78. The central facility according to claim 71, the processor filters the orders to enable the trading station of the trading party to display orders of the plurality of trading parties, the displayed orders of the selected trading parties being distinguished from displayed orders other than the selected counter-parties.

79. The central facility according to claim 71, wherein the processor filters the orders to enable the trading station of the trading party to display orders of trading parties in which the trading party and another trading party are willing to transact with each other.

80. The central facility according to claim 71, wherein the trading preferences includes an identity of the selected trading parties and priority levels associated therewith, the processor filters the orders to enable the trading station of the trading party to display selectively orders of the selected trading parties according to their priority level.

81. The central facility according to claim 71, wherein the processor filters the orders to enable the trading station of the trading party to display only the orders of the selected trading parties.

82. The central facility according to claim 71, wherein the processor further facilitates transmission of electronic mail from the trading party to another trading party of an order, the electronic mail proposing modification of at least a term or condition of the order from the another trading party and being associated with the order.

83. The central facility according to claim 71, wherein the processor further executes a matching bid and offer of the orders only if trading parties corresponding to the matched bid and offer agree to transact with each other based on their trading preferences

84. A trading system, comprising:

a plurality of trading stations for receiving and displaying orders from a plurality of trading parties; and

a central facility, in communication with the plurality of trading stations, for processing the orders of the plurality of trading parties,

wherein at least one trading station, associated with a trading party, displays orders of selected trading parties that the trading party is willing to transact with according to trading preferences of the trading party.

85. The trading system according to claim 84, wherein said trading system displays said orders according to trading preferences of the trading party and said selected trading parties.

86. The trading system according to claim 84, wherein the trading station of the trading party filters orders of the trading parties to identify for display orders of the selected trading parties according to the trading preferences.

87. The trading system according to claim 84, wherein the central facility filters orders of the counter-parties to identify for display orders of the selected trading parties

according to the trading preferences of the trading party and transmits the filtered orders to the trading station for display to the trading party.

88. The trading system according to claim 84, wherein the central facility transmits orders of all counter-parties including the identified orders to the trading station for display to the trading party.

89. The trading system according to claim 84, wherein one of the central facility and the trading station suppresses any information identifying a source of the orders to prevent display of the source information to the trading party.

90. The trading system according to claim 84, wherein the trading station enables the trading party to generate electronic mail proposing modification of at least a term or condition of an order from another trading party and automatically associates the electronic mail with the order.

91. The trading system according to claim 90, wherein the trading station sends the electronic mail to a trading station associated with the another trading party, via the central facility.

92. The trading system according to claim 90, wherein a copy of the electronic mail is stored at the trading station of the trading party.

93. The trading system according to claim 90, wherein a copy of the electronic mail is stored at the central facility.

94. A method of tracking electronic mail between a trading party and a counter-party in a trading system, comprising:

enabling a trading party to generate electronic mail proposing modification of at least a term or condition of an order from a counter-party;

automatically associating the electronic mail with the order; and

sending the electronic mail to the counter-party.

95. The method according to claim 94, wherein the step of automatically associating completes a subject matter field of the electronic mail with a transaction identifier corresponding to the order.

96. The method according to claim 94, wherein the step of automatically associating encodes the electronic mail with a transaction identifier corresponding to the order.

97. The method according to claim 94, further comprising storing the electronic mail at a trading station associated with the trading party in the trading system.

98. The method according to claim 94, further comprising storing the electronic mail at a central facility in the trading system.

99. The method according to claim 94, further comprising automatically completing header fields of the electronic email to identify the trading party as a sending party and the counter-party as a receiving party.

CENTRAL FACILITY

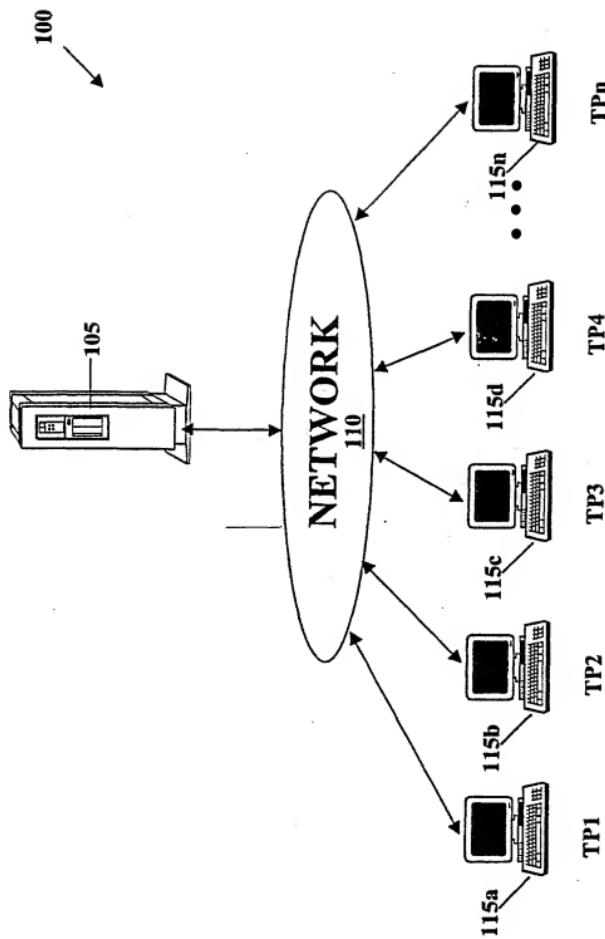


FIG. 1

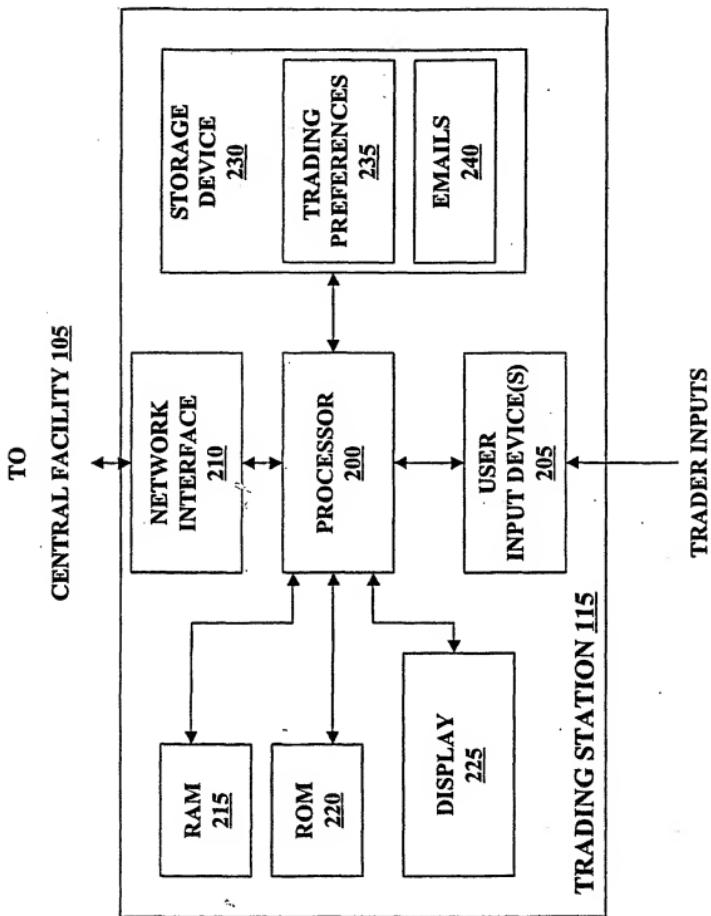


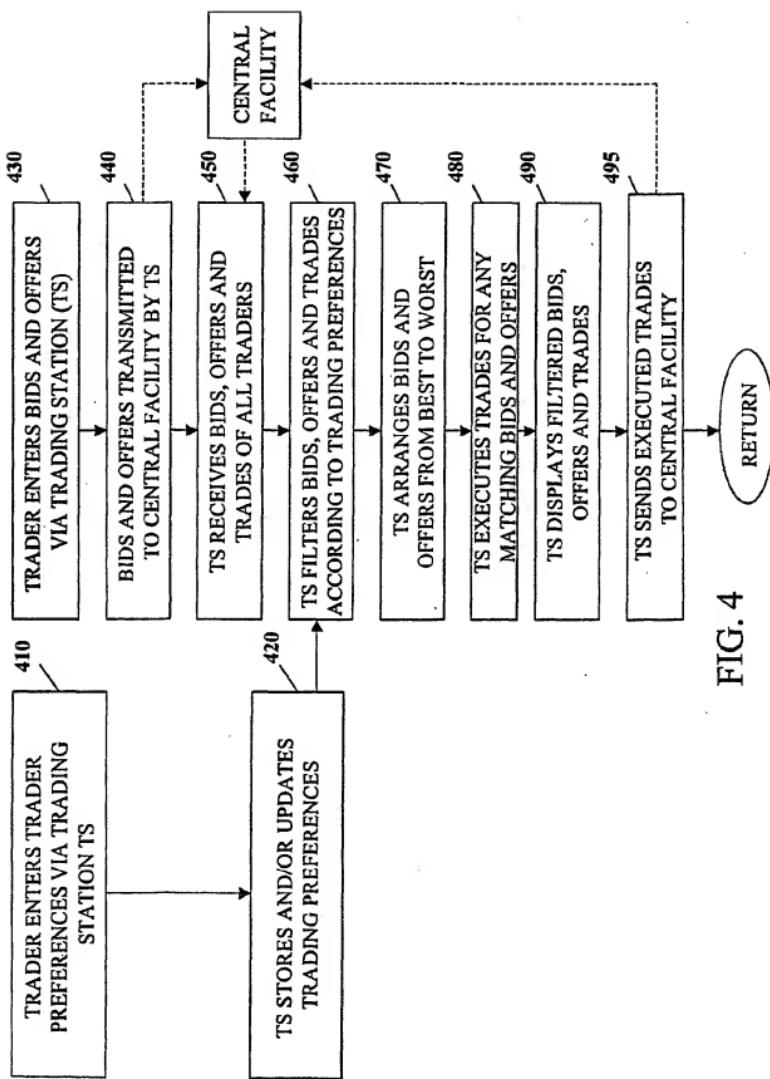
FIG. 2

235



| Trader | TRADE (YES/NO) | PRIORITY LEVEL | AMOUNT LEVEL |
|--------|-------------------|-------------------|-----------------|
| TP0 | 310 | 320 | 330 |
| TP1 | NO | - | - |
| TP2 | YES | PREFERRED | UNLIMITED |
| TP3 | NO | - | - |
| [...] | | | |
| TPn | YES | ACCEPTABLE | \$1 MILLION |

FIG. 3



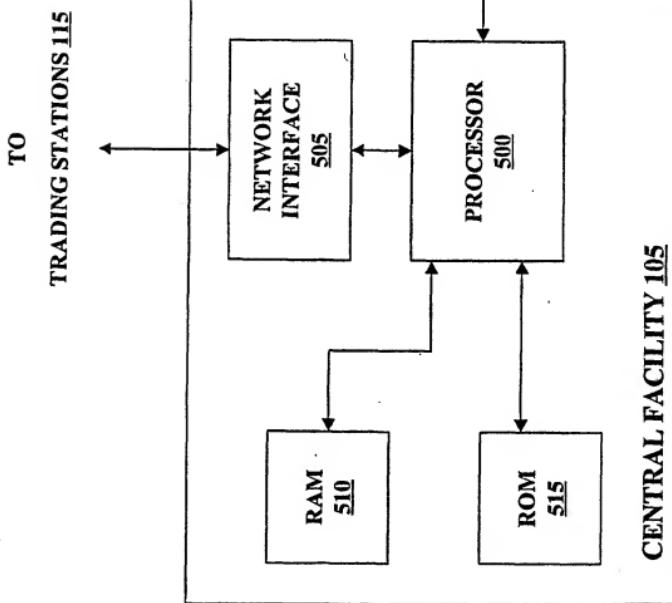


FIG. 5

535A



| TRADER | ACCEPTABLE COUNTER-PARTIES |
|-----------------|--------------------------------------|
| <u>605</u> | <u>610</u> |
| TP1 | TP1, TP2, TP3, TP9, TP _n |
| TP2 | TP2, TP8, TP9, TP15, TP _n |
| TP3 | TP1, TP2, TP3, TP5, TP _n |
| [...] | |
| TP _n | TP1, TP2, TP3, TP6, TP _n |

FIG. 6A

535B



| TRADE 615 | FEASIBLE COUNTER-PARTIES 620 |
|--------------|---------------------------------|
| TP1 | TP1, TP3, TP9, TPn |
| TP2 | TP2, TP8, TP15, TPn |
| TP3 | TP1, TP3, TP5, TPn |
| [..] | |
| TPn | TP1, TP2, TP3, TP6, TPn |

FIG. 6B

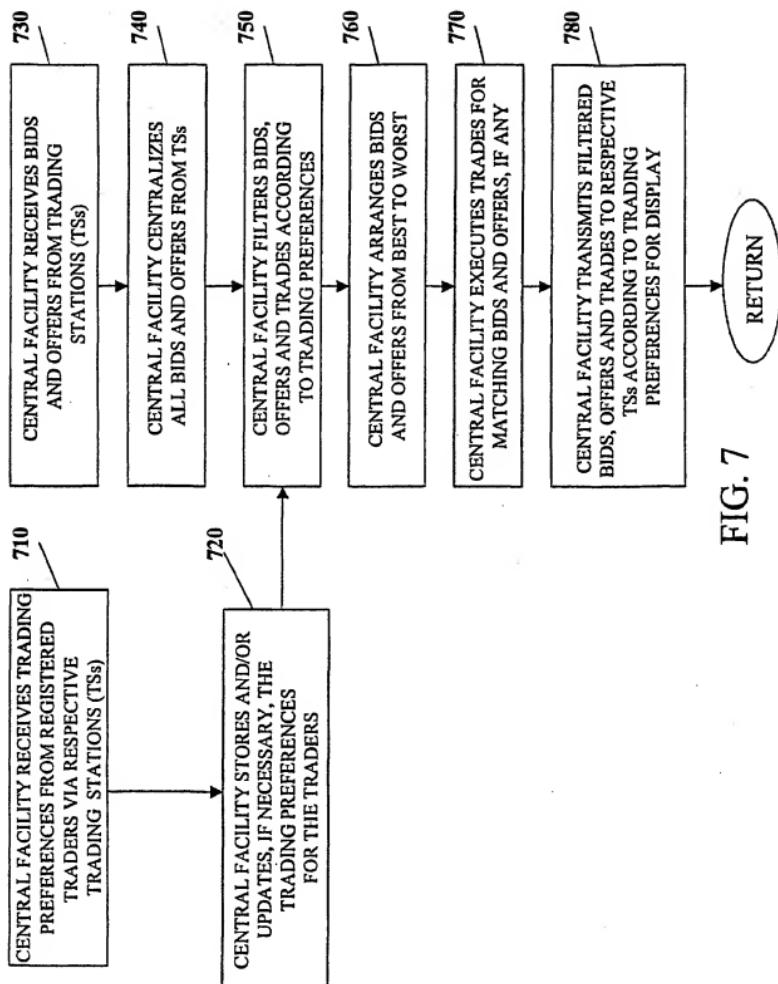


FIG. 7

| <u>BIDS</u> | | | <u>OFFERS</u> | | |
|-------------|--------------|---------------|---------------|--------------|---------------|
| <u>QTY</u> | <u>PRICE</u> | <u>SOURCE</u> | <u>QTY</u> | <u>PRICE</u> | <u>SOURCE</u> |
| 1,500 | 95.25 | TP15 | 11,000 | 96.00 | TP1 |
| 2,000 | 85.00 | TP9 | 1,000 | 105.50 | TPn |
| 4,000 | 50.00 | TP1 | 8,000 | 106.00 | TP2 |
| 9,000 | 45.00 | TP2 | 15,000 | 112.00 | TP3 |
| 6,000 | 44.00 | TPn | 6,000 | 122.00 | TP4 |
| 10,000 | 36.00 | TP6 | 400 | 123.00 | TP9 |
| 500 | 35.00 | TP2 | 3,500 | 146.00 | TP7 |
| 3,000 | 20.00 | TP3 | 5,000 | 147.00 | TP5 |

| <u>BIDS</u> | | | <u>OFFERS</u> | | |
|-------------|--------------|---------------|---------------|--------------|---------------|
| <u>QTY</u> | <u>PRICE</u> | <u>SOURCE</u> | <u>QTY</u> | <u>PRICE</u> | <u>SOURCE</u> |
| 1,500 | 95.25 | TP15 | 11,000 | 96.00 | TP1* |
| 2,000 | 85.00 | TP9* | 1,000 | 105.50 | TPn* |
| 4,000 | 50.00 | TP1* | 8,000 | 106.00 | TP2* |
| 9,000 | 45.00 | TP2* | 15,000 | 112.00 | TP3* |
| 6,000 | 44.00 | TPn* | 6,000 | 122.00 | TP4 |
| 10,000 | 36.00 | TP6 | 400 | 123.00 | TP9* |
| 500 | 35.00 | TP2* | 3,500 | 146.00 | TP7 |
| 3,000 | 20.00 | TP3* | 5,000 | 147.00 | TP5 |

*ACCEPTABLE COUNTER-PARTIES SHOWN IN BOLDFACE

FIG. 8B

| BIDS | | | OFFERS | | |
|-------|-------|--------|--------|--------|--------|
| QTY | PRICE | SOURCE | QTY | PRICE | SOURCE |
| 2,000 | 85.00 | - | 11,000 | 96.00 | - |
| 4,000 | 50.00 | - | 1,000 | 105.50 | - |
| 9,000 | 45.00 | - | 8,000 | 106.00 | - |
| 6,000 | 44.00 | - | 15,000 | 112.00 | - |
| 500 | 35.00 | - | 400 | 123.00 | - |
| 3,000 | 20.00 | - | | | |

* UNACCEPTABLE COUNTER-PARTIES DELETED

FIG. 8C

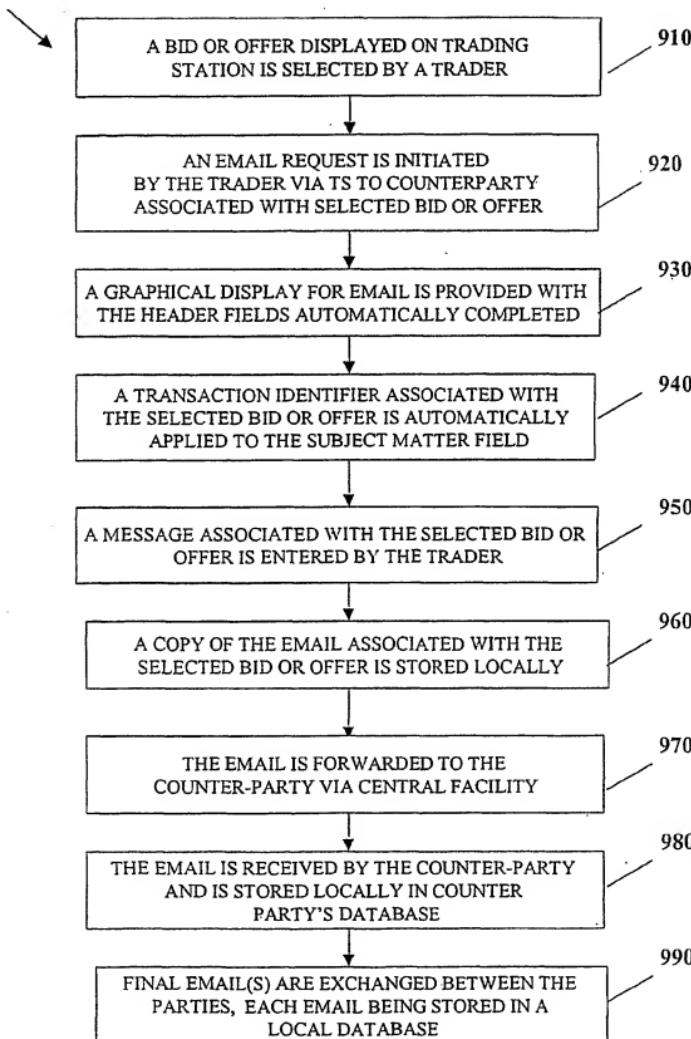
| <u>BIDS</u> | | | <u>OFFERS</u> | | |
|-------------|--------------|---------------|---------------|--------------|---------------|
| <u>QTY</u> | <u>PRICE</u> | <u>SOURCE</u> | <u>QTY</u> | <u>PRICE</u> | <u>SOURCE</u> |
| 2,000 | 85.00 | - | 11,000 | 96.00 | - |
| 4,000 | 50.00 | - | 1,000 | 105.50 | - |
| 6,000 | 44.00 | - | 15,000 | 112.00 | - |
| 3,000 | 20.00 | - | 400 | 123.00 | - |

*ONLY FEASIBLE COUNTER-PARTIES ARE DISPLAYED

FIG. 8D

900

FIG. 9



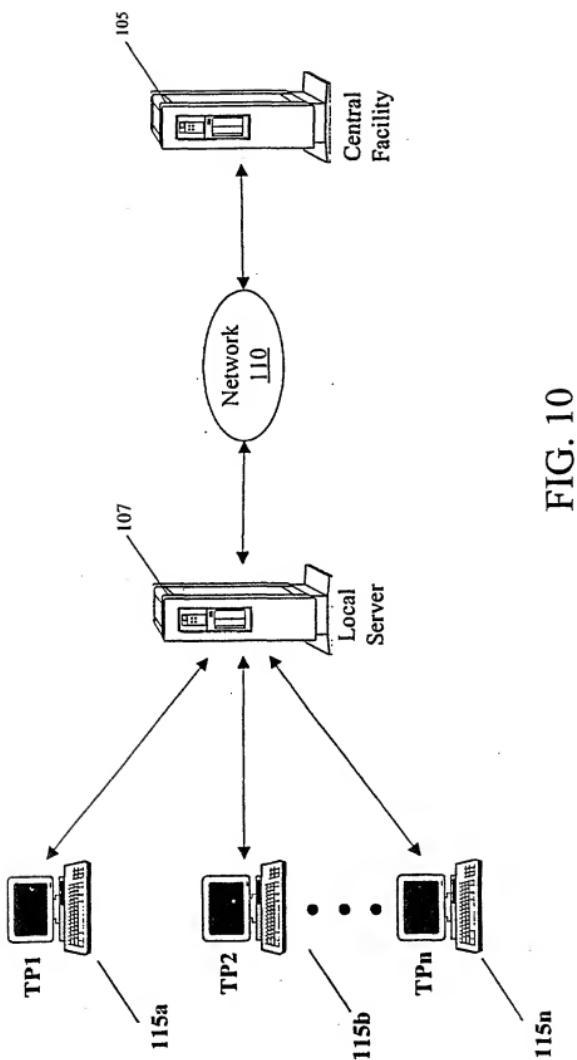


FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/01093

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G06F 17/60

US CL :705/37, 35

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/37, 35

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST 2.0

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------------------|
| X | US 5,924,082 A (SILVERMAN et al) 13 July 1999, col. 6 L15- col. 13 L57 | 1-18, 25-44, 51-64, 71-81, 85-89 |
| Y | | 19-24, 45-50, 65-70, 82-84, 90-99 |
| Y | US 5,717,989 A (TOZZOLI et al) 10 February, 1998, col. 11 L 1- col. 13 L 34 | 19-24, 45-50, 65-70, 82-84, 90-99 |
| A | US 5,168, 446 A (WISEMAN) 01 December 1992, entire document | 1-99 |

Further documents are listed in the continuation of Box C. See patent family annex.

| | | |
|--|---|---|
| Special categories of cited documents: | *T* | later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| *A* | document defining the general state of the art which is not considered to be of particular relevance | |
| *B* | earlier document published on or after the international filing date | *X* |
| *L* | document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | *Y* |
| *O* | document referring to an oral disclosure, use, exhibition or other means | |
| *P* | document published prior to the international filing date but later than the priority date claimed | *E* |

| | |
|--|---|
| Date of the actual completion of the international search 01 MARCH 2001 | Date of mailing of the international search report 18 APR 2001 |
|--|---|

| | |
|---|--|
| Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230 | Authorized officer VINCENT MILLIN Telephone No. (703) 308-1065 |
|---|--|

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01093

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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